
# Decision making by stakeholders

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# Risk perception

# Why are risks important ?

- Financial return without risk does not exist
- In real life nearly all developments are uncertain
- Risks can slow down implementation rate
- Risks increase cost
- Simple financial analyses do not reflect this reality
  - All sorts of uncertainties affect expected return on investment
  - Minimum level of certainty required before investment decision
  - Insight in risks essential for obtaining finance

# Risks affect position of 4 "players"

## banks - project financers

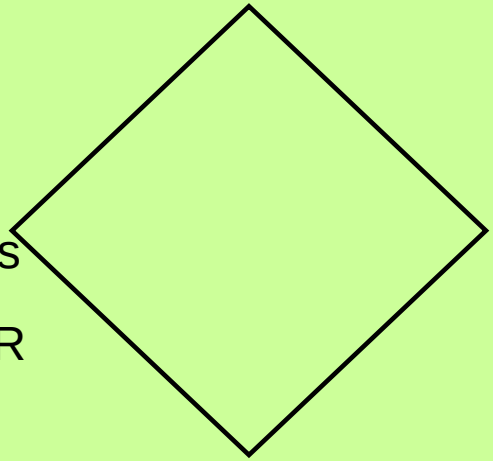
main risk: failure to repay

mitigation: debt service coverage
long-term income guarantees
collateral

## project investor

main risk: failure to repay

mitigation: long-term contracts
fixed prices
demand higher IRR



## electr. supplier

main risk: over payment
loss of supply

mitigation: flexible pricing
price discounts
short-term contracts

## government

main risk: failure to meet overall targets

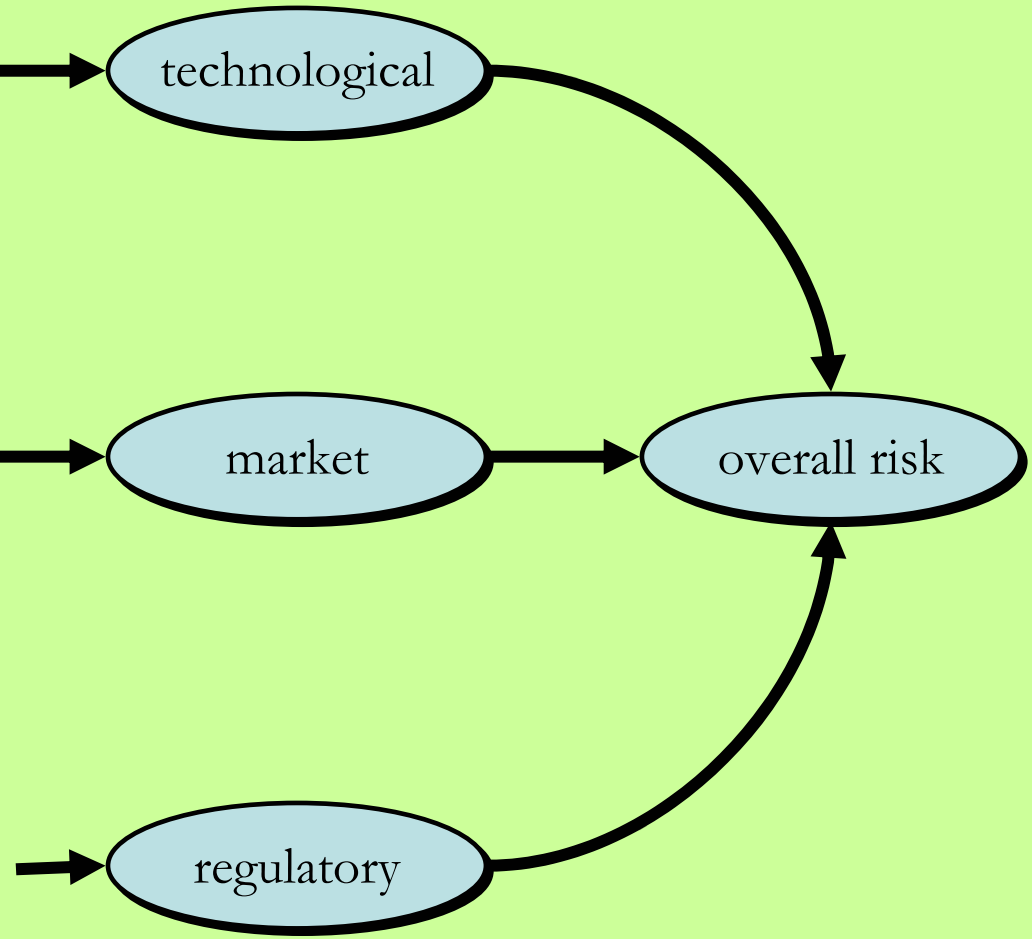
mitigation: financial support mechanisms
guarantees

# Projects have risks at three levels

- Investment costs
- Load hours
- Maintenance costs
- Efficiency
- etc.

- Electricity price
- Transport costs
- Fuel price
- Import/Export capacity
- Inflation,
- Etc.

- Financial support home market
- Import-export opportunities
- Subsidies on investments
- Support export market

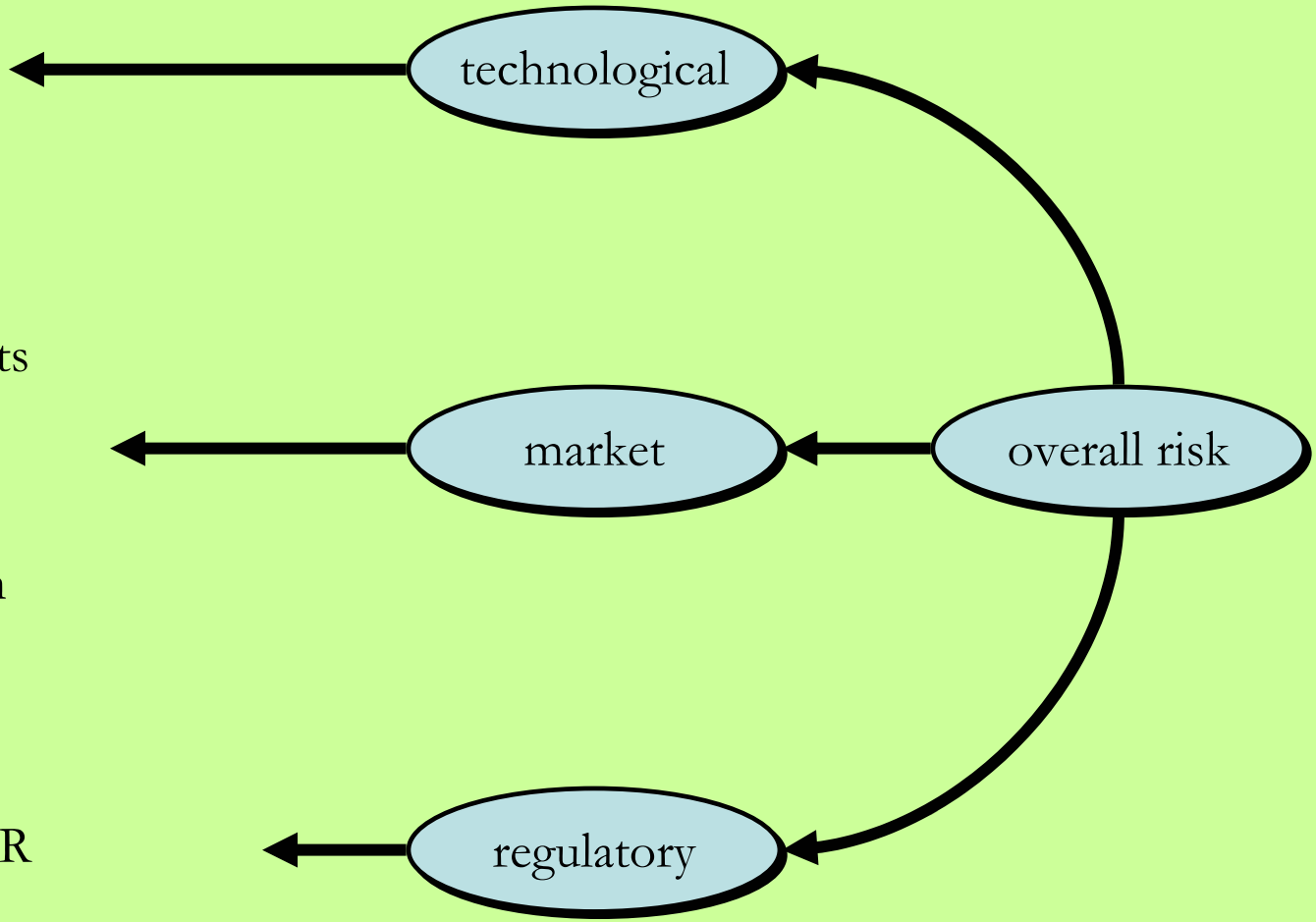


# Risk mitigation by projects owners

- project selection
- vendor selection
- O&M strategie
- insurance
- guarantees

- long-term contracts
- hedging
- planning
- fall back options
- fuel diversification

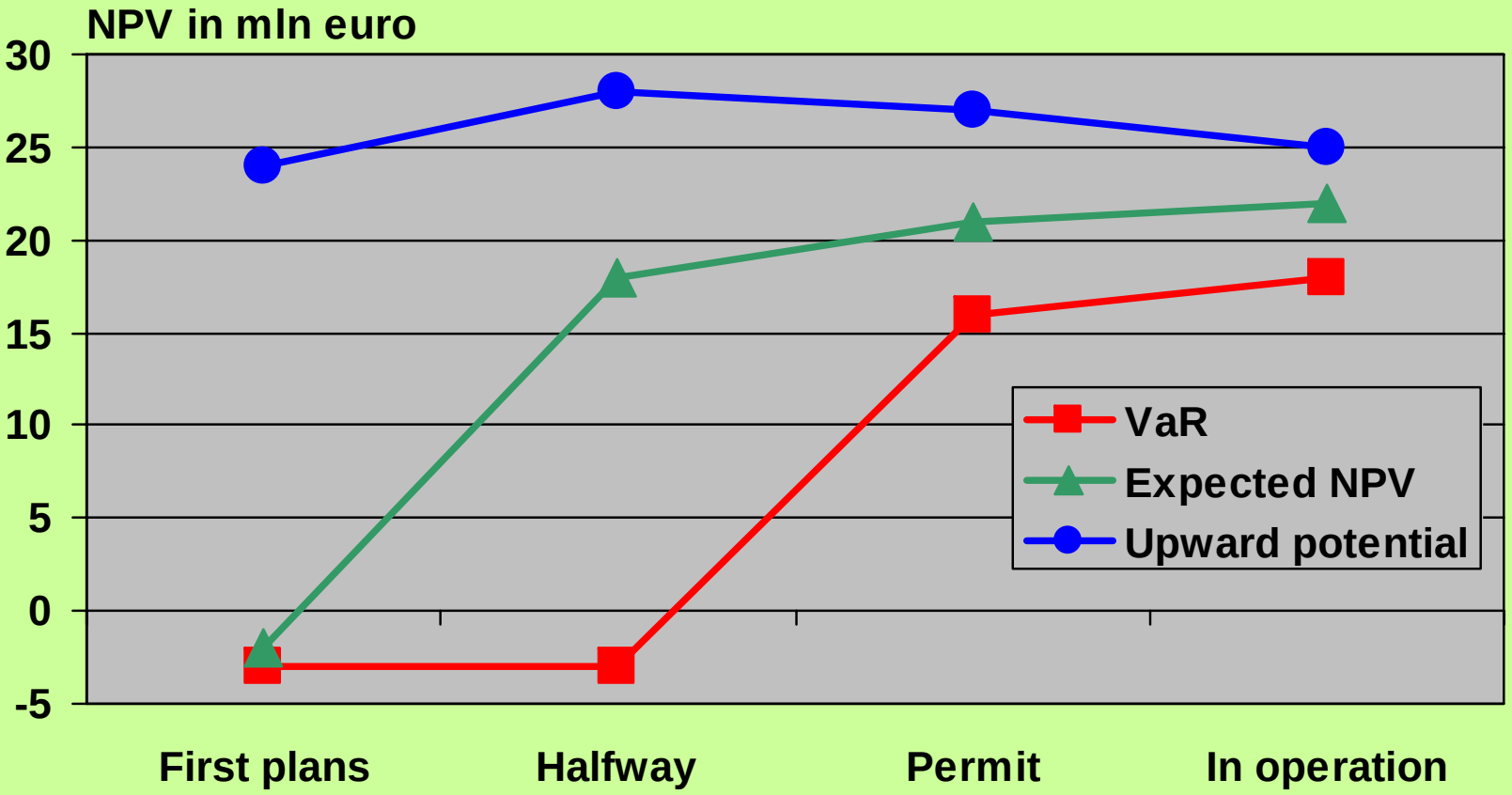
- project selection
- demand higher IRR
- diversification.



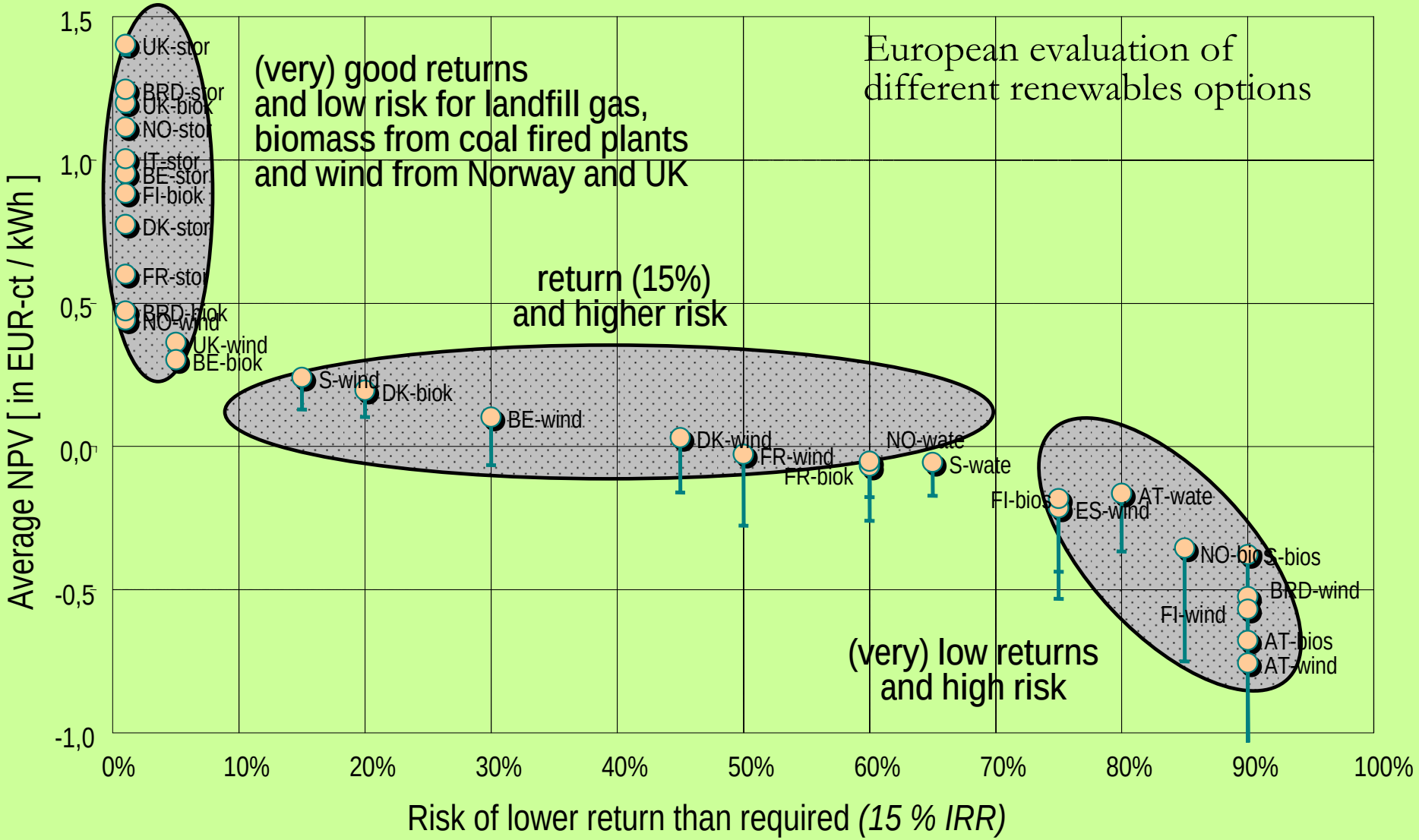
# Financial support is main driver

| | feed-in tariffs | certificates - flexible | no financial support |
|---|---|---|---|
| common char. | • fixed rates<br>• usually fixed period<br>• fixed technologies | • moving prices<br>• period not determined<br>• fixed technologies | • moving prices<br>• period not determined<br>• not applicable |
| guarantee | • government | • supplier | • depends on export market |
| IRR | • law maximizes<br>• minimum set by investors and banks | • market maximizes<br>• minimum set by investors and banks | • market maximizes<br>• minimum set by investors and banks |
| largest risk | • site / technology | • regulatory change | • regulatory export mrkt |

# Project risk varies over time



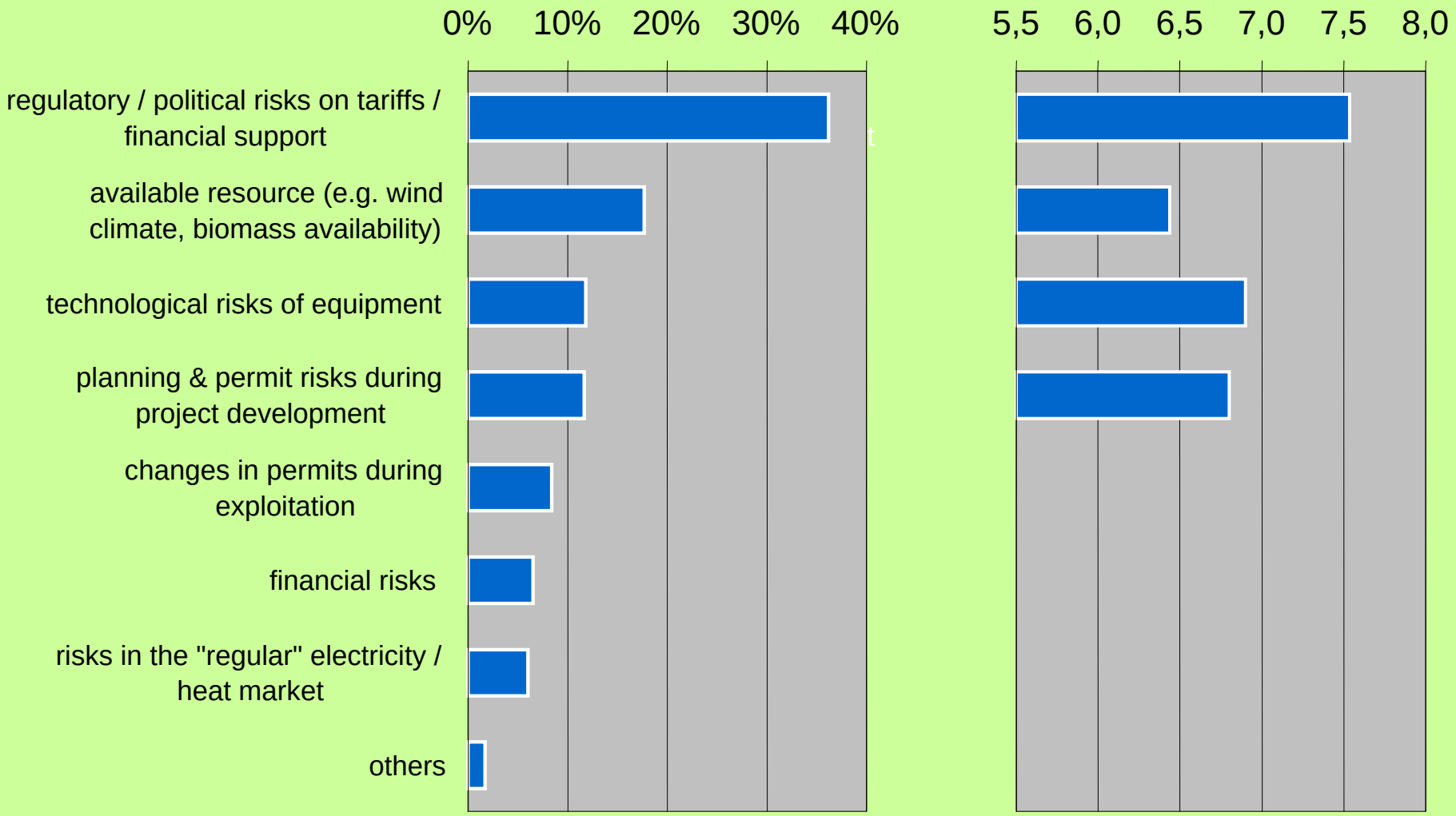
# Example: European projects fall in 3 clusters



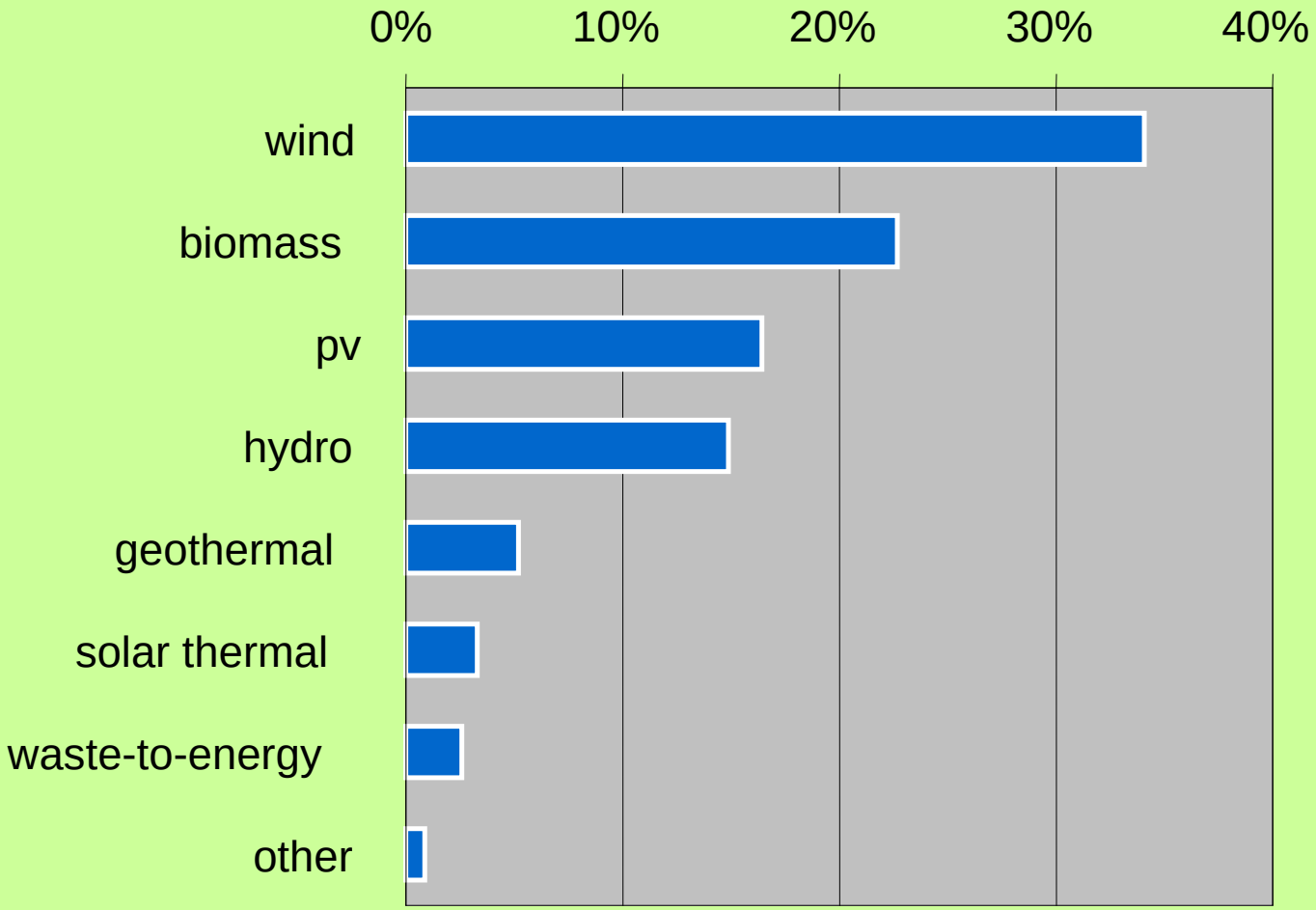
# How do stakeholders perceive risks

- Method
  - Inventory among 400 stakeholders
  - Interviews with officials from banks, project developers, utilities, government
- Topics
  - Technology: wind offshore, onshore, biomass
  - Role of regulatory framework
  - Finance
  - Risk perception

# Main perceived risk

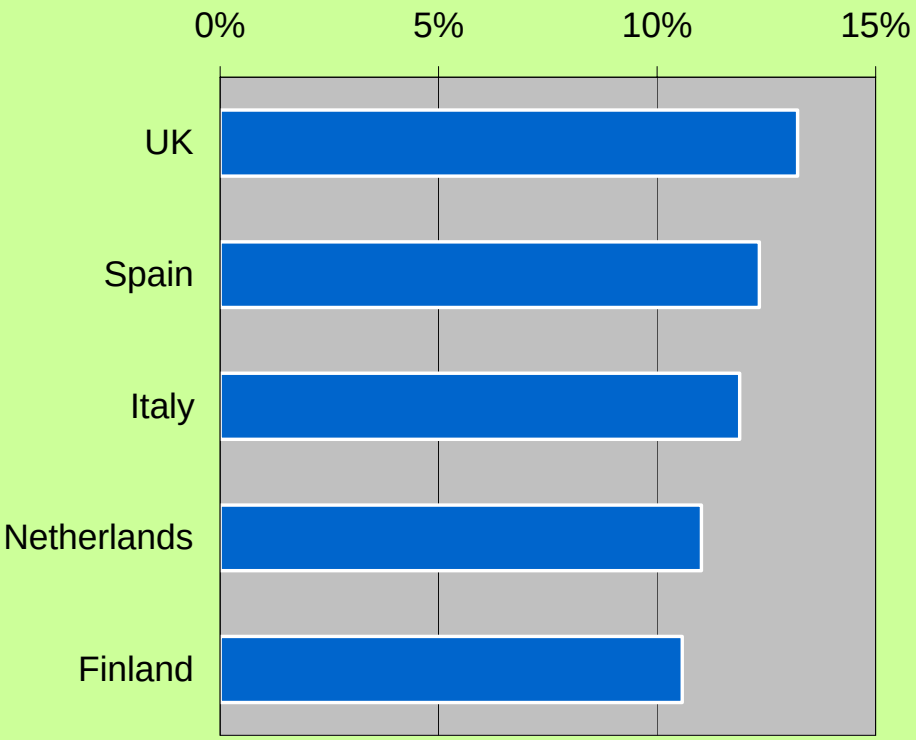


# RES sources most subject to risk

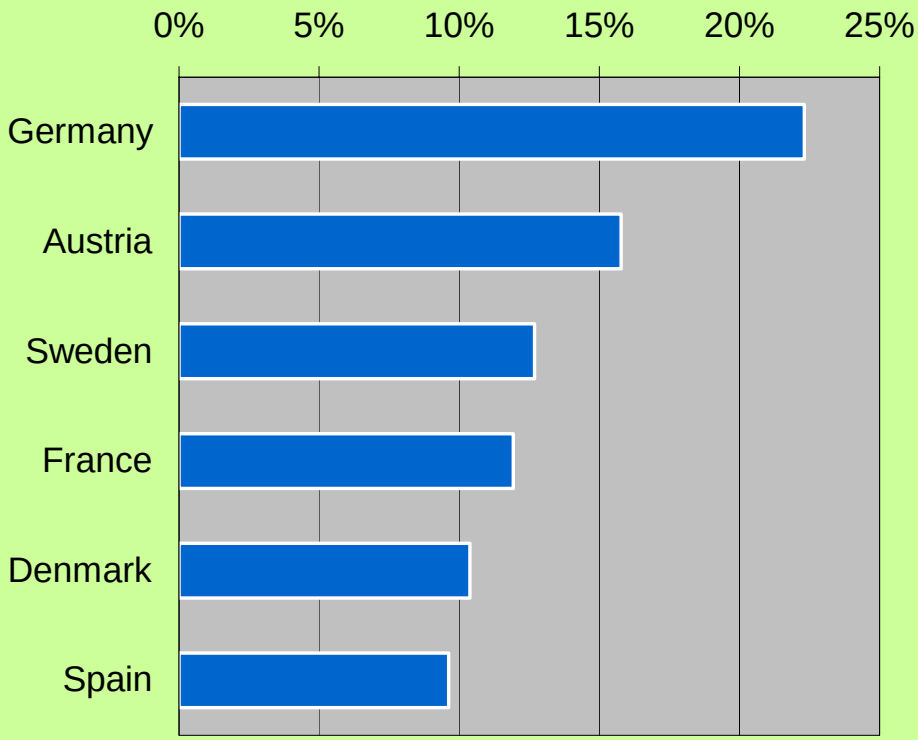


# Perceived country risk

Countries most subject to risk




Countries least subject to risk



# Onshore wind mature?

Wind turbines in Spain

- Technology
  - Proven technology, but
  - Are wind turbines growing too fast
- Steady cash flows
  - uncertainty over climatological effects (less wind?)
- Technology risk for large wind turbines
  - Are wind turbines growing to fast
- Concentration of manufacturers
- Pooled finance

# Offshore wind is starting up

- Potential is very large
  - 50 GW = 100 billion Euros
- Banks hesitant
  - No track record, problems in Horns Rev
  - corporate finance, strong players needed
  - At least 50% equity required
  - Onshore wind as backing for Offshore
- Joint ventures are willing to take risk
- Scale
  - Size of projects
  - Size of manufacturers

# Biomass is in critical phase

- Many projects have been initiated
- Operations are not meeting expectations
  - high maintenance
  - low availability
- “one more failure and the European banks will withdraw”

# Risks are crucial for obtaining finance

- Stability of regulatory framework is important for getting finance
- Banks are able to adapt to different subsidy schemes
  - front load, shorter tenors
  - need time to adapt
- Debt Service Coverage Ratio is main driver for measuring risk
  - Minimum cash flow guarantees
- Technology rating
  - Not country specific
  - Mainly determined by confidence level (track record)
- Large projects require bank syndication
  - Maximum position for single bank appr. 50 million Euro

# Project vs. Corporate Risk Finance

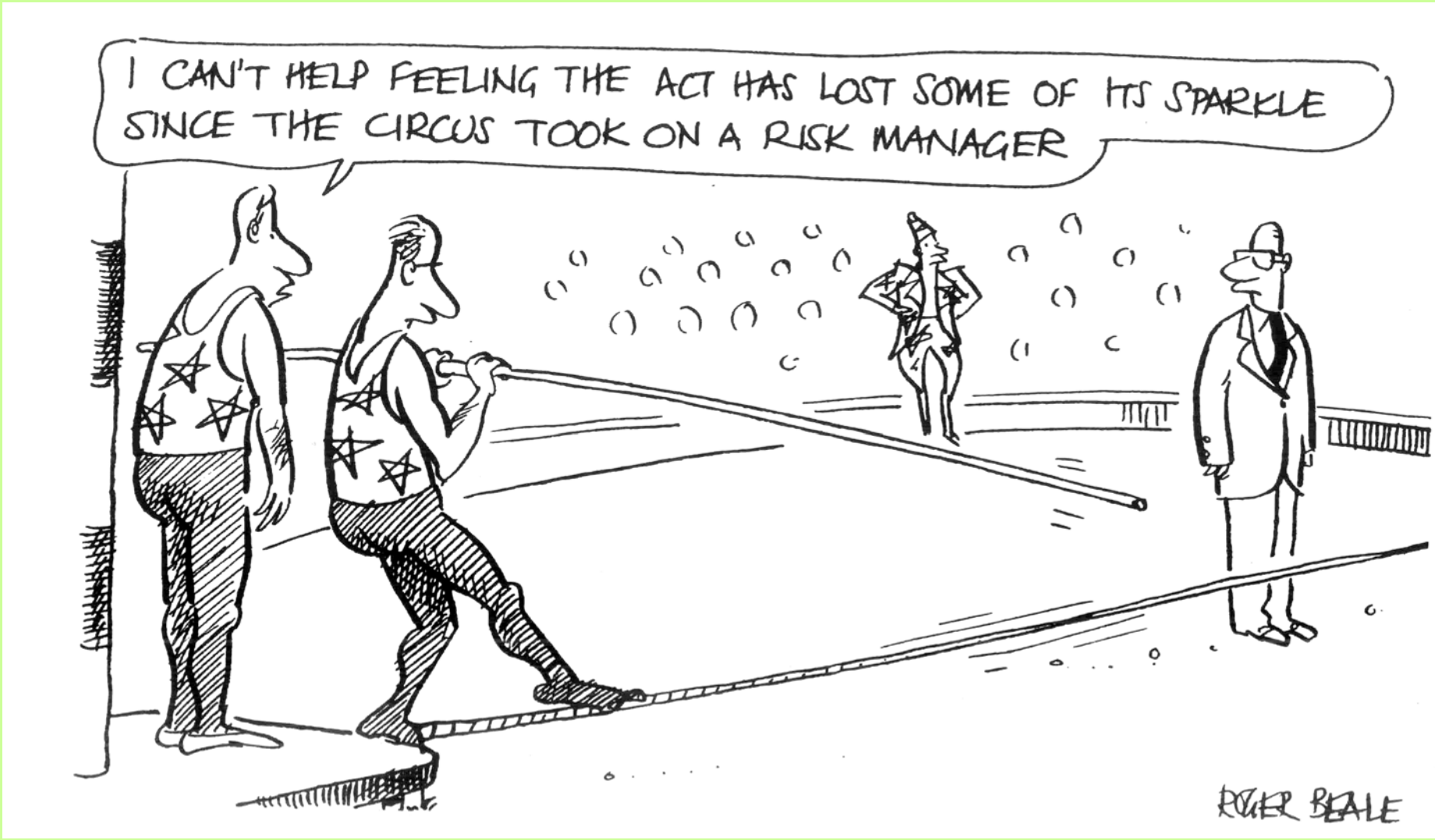
| | Project Finance | Corporate Finance |
|---|---|---|
| Guarantees | Project assets & sponsor equity | Corporate Assets |
| Debt Equity ratio | 70 – 90% | 30 – 70% |
| Interest rates | Project rating | Company rating |
| Bankability | Credit rating of project partners<br>Contractual links<br>Risks outside project<br>DSCR<br>Technology | Financial strength sponsor<br><br><br><br><br>Technology |

# Estimated WACC

| | Wind onshore | | | Biomass | | Wind Offshore | |
|---|---|---|---|---|---|---|---|
| | TGC | FIT | Wind fund | TGC | FIT | TGC | FIT |
| $\beta_{eq}$ | 1.60 | 1.44 | 0.80 | 2.24 | 2.02 | 2.56 | 2.30 |
| Required Return on Equity | 10.4% | 9.5% | 6.3% | 13.6% | 12.5% | 15.3% | 14.0% |
| Post tax cost of debt | 3.3% | 3.3% | 3.3% | 3.3% | 3.3% | 3.3% | 3.3% |
| Weighted Average Cost of Capital | 5.4% | 4.9% | 4.0% | 6.4% | 5.6% | 6.9% | 6.0% |

# Conclusions

- Risk plays a dominant role in the decision-making for RE
- Stability of instruments increases bankability
- Market is able to adapt to different support systems
- New technology has to prove itself sponsors are crucial
- Risk reduction leads to lower costs
- WACC is used as modifier in GreenX cost curves?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ROGER BEALE